

**WHAT IS CLAIMED IS:**

**1. A combination lock comprising:**

a substantially parallelepiped body;

a U-shaped shackle having a long leg and a short leg;

5 a plurality of parallel dials disposed at one side of the body with a lower portion of the long leg being releasably locked therein;

a longitudinal bore disposed at the other side of the body, the longitudinal bore including an upper receiving hole, a lower cavity, an intermediate channel in communication with both the receiving hole and the cavity; and

10 a key opening mechanism disposed in the longitudinal bore, the key opening mechanism comprising:

a first spring;

a cylinder slidably provided in the receiving hole, the cylinder including an upper bore with a terminating end of the short leg being received therein in a  
15 locked position, a bottom shoulder with the first spring being put on, a lower bore in communication with the upper bore, a ring disposed between the upper and lower bores, a plurality of longitudinal ridges having an inclined bottom end, the ridges being provided on an inner wall of the lower bore and being equally spaced apart therearound, a first ratchet member formed on a lower portion of  
20 the shoulder, and two opposite tabs on an outer surface;

a sleeve including two opposite recesses on an inner surface with the tabs received therein when the sleeve is put on the cylinder, the sleeve being urged upwardly by the first spring;

a trigger member upwardly biased against a bottom of the ring, the trigger  
25 member including a plurality of equally spaced dents on an edge of its upper circular portion, the dents being slidably put on the ridges, and a lower first toothed member;

a staged post provided in the lower bore and including a top second toothed member in contact with the first toothed member, and a plurality of equally spaced projections on an upper part of an outer surface so that a longitudinal groove is formed between two adjacent projections, and a second  
5 ratchet member formed on upper edges of the projections;

a second spring having a top end urged against bottoms of the projections;

a staged abutment member including a top hole with a lower portion of the post inserted therein, a top flat urged by a bottom end of the second spring, a third ratchet member formed on a projected intermediate portion, the third  
10 ratchet member being matingly shaped with respect to the first ratchet member, and a lower, hollow cylindrical member disposed in the channel; and

a lock core provided in the cavity and including a top protuberance inserted into the hollow cylindrical member for fastening, wherein in an assembled position the third ratchet member is not matingly engaged with the first ratchet  
15 member so as to form a space between a bottom of the post and a bottom of the top hole of the abutment member;

wherein in the locked position it is operable to insert a key into the lock core and turn the key to rotate the abutment member without a correct combination being formed by the dials, the cylinder is pushed down by an expansion of the  
20 first spring when the first and second ratchet members are matingly engaged, and the terminating end of the short leg is disengaged from the upper bore for unlocking the combination lock; and

in the unlocked position it is operable to press the trigger member for moving the post down until the grooves clear from the ridges, rotate the post a  
25 predetermined degree to matingly engage the first and second toothed members together, release the trigger member to cause both itself and the post to move up, the inclined bottom ends of the ridges are gradually engaged with

and finally stopped by the second ratchet member, the post is stopped from moving up, and the space is reduced a predetermined extent to inhibit the terminating end of the short leg from moving out of the upper bore by turning the key.

- 5    2.    The combination lock of claim 1, wherein the number of each of the ridges, the grooves, and the dents is four.